

3.13 SAFETY

Safety issues addressed in this section include ground, flight, and explosive safety considerations. The ROI for safety is the area encompassed by McGregor Range. Fire safety is generally included as part of ground safety but is also considered in other categories, as well. Ground safety concerns activities associated with on-going operations and maintenance. Ground safety also considers potential hazards associated with the delivery of ordnance on weapons ranges. Aircraft flight safety addresses the risk of aircraft mishaps, and includes both rotary- and fixed-wing aircraft operations throughout the restricted airspace which supports military activities on McGregor Range. Explosive safety considerations involve the use, storage, processing, and handling of ordnance used on the range in support of the Fort Bliss mission.

3.13.1 Ground Safety

All day-to-day operations and maintenance activities on McGregor Range are performed by trained, qualified personnel, and are conducted in accordance with applicable equipment technical directives, approved occupational safety and health standards, and sound maintenance practices. The handling, processing, storage, and disposition of any hazardous by-products, resulting from operations and maintenance, are accomplished in accordance with all federal and state requirements applicable to those specific substances.

McGregor Range supports delivery of a wide variety of ground-to-ground, ground-to-air, and air-to-ground ordnance. McGregor Range is the major range supporting air defense weapons systems. The various ranges supported by the McGregor Range Camp are involved in ground-based activity, and the ordnance they support are shown in Table 3.13-1.

Table 3.13-1. Activities Conducted on Ranges Supported by McGregor Range Camp

<i>Site Designation</i>	<i>Ordnance Supported</i>
TAC0, TAC1, TAC7, TAC12, TAC18, TAC24	Patriot Missile
Hawk Sites 1 through 8	Hawk
Field Firing Sites A, C, E, G	Hawk, MLRS
FAW Site 10	Stinger, Chaparral, Avenger, Roland, M60, .50 cal., 81mm mortar (illumination only)
FAW Site 4	81mm mortar (illumination only), M3, M60, .50 cal, M16
Aerial Gunnery Range, Cane Cholla	2.75-in rockets, 7.62mm, 40mm, 20mm, Light Antitank/Antiarmor Weapon (LAW), 81mm mortar, 4.2 in. mortar (mortars used for illumination only)
ATACMS	ATACMS
Demolition Site 2	Explosive Ordnance Disposal (EOD), Demolition Training. (Maximum net explosive weight 5,000 pounds)

Note: Demolition Site 2 is not on Meyer Range 23.

Source: U.S. Army, 1996m.

All activity on McGregor Range is governed by detailed safety standards documented in SOPs. For each weapon or weapon system used, SDZs are projected onto the ground around the firing area, under the projectile's flight path, and around the impact area. These zones account for the flight, impact, fragmentation pattern, and possible ricochet of the projectile after it impacts the ground, as well as any

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debris patterns that would be associated with the projectile or its target. SDZs are unique to each specific type of ordnance, and vary in size and shape depending on the weapon used.

Prior to any launch or firing, these areas are subjected to an aerial sweep to ensure they are clear of unauthorized personnel and equipment. Once cleared, access points are monitored to ensure no personnel inadvertently enter the hazardous area. Access is barred until the range is declared safe (U.S. Army, 1996m).

Detailed guidance for the safe conduct of the firing is provided in SOPs. Potential malfunctions (e.g., misfires, hangfires, etc.) are considered, and safety procedures are prescribed to ensure a safe recovery and disposition of the malfunctioning munition.

The Orogrande Range and the SHORAD are also part of the McGregor Range complex. The Orogrande Range is used primarily by the TEXCOM's ADA Test Directorate for weapons system testing. The range can support use of Chaparral, Stinger, and Avenger missiles, 81mm mortars (illumination only), and laser operations. Weapons supported by the SHORAD Range include Stinger, Avenger, and Chaparral missiles, 25mm, 7.62mm, and .50 caliber ammunition (U.S. Army, 1996b).

The Meyer Range Complex is located approximately 6 miles southeast of the McGregor Range Camp. The range supports small arms, hand grenades, M-60 machine guns, Claymore mines, M249, M203, AT-4, and M79 grenade launchers (U.S. Army, 1996b).

As with all ranges on the McGregor complex, detailed safety procedures are documented in SOPs that govern the use of each specific weapon/weapon system employed on the Orogrande, SHORAD, and Meyer ranges.

Table 3.13-2 summarizes ordnance expended on the McGregor ground ranges in 1996.

There is one fire truck stationed at the McGregor Range Camp. However, this truck is limited in response to the cantonment area of the range camp and a 5-mile radius around that area (Kern, 1997).

The initial response element to fires detected on ranges would be the troops assigned to the military unit using the range. SOPs require dedication of some troops to fire response (U.S. Army, 1996b). If a fire escapes from the immediate area of ignition and begins to spread, additional response would be requested from the Fort Bliss Fire Department. Depending on the specific location of the fire, and its indicated potential involvement, other agencies may be requested to respond. However, the U.S. Army is not part of any interagency support agreements with the BLM or mutual support agreements with any civil fire departments in the region (Kern, 1997).

3.13.2 Flight Safety

The public's primary concern regarding flight safety is the potential for aircraft accidents. Such mishaps may occur as a result of mid-air collisions, collisions with man-made structures or terrain, weather-related accidents, mechanical failure, pilot error, or bird-aircraft collisions. Flight risks apply to all aircraft; they are not limited to the military.

The military services define four categories of aircraft mishaps: Classes A, B, C, and high accident potential (HAP). Class A mishaps result in a loss of life, permanent total disability, a total cost in excess of \$1 million, destruction of an aircraft, or damage to an aircraft beyond economical repair. Class B and C mishaps, and HAP, are less serious, result in lower costs, and cause less serious injuries. This LEIS focuses on Class A mishaps because of their potentially catastrophic results.

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Table 3.13-2. Ordnance Expended on McGregor Ground Ranges

<i>Ordnance</i>	<i>Range</i>						
	<i>TAC Sites</i>	<i>Hawk Sites</i>	<i>Field Firing Sites</i>	<i>FAW Sites</i>	<i>ATACMS</i>	<i>SHORAD</i>	<i>Meyer</i>
Patriot	38						
Stinger				315		63	
ATACMS					6		
Roland				4			
Avenger				2		13	
Chaparral				90		2	
Hawk		34					
MLRS			130				
BAT				453		78	
STLS				35		48	
ADATS				14			
.50 Cal				4,200		59,190	
5.56mm							620,170
7.62mm						58,060	34,049
9mm							53,431
25mm						7,410	
M3P						4,000	
M249							7,100
40mm							250
M203							430
Pellets							3350
NBC							21
Grenades							83
M60							300
M64							10
M67							100
BGM71E							9
MK19							425
12 Gauge							300

Source: U.S. Army, 1996m.

While it is impossible to predict the precise location of an aircraft accident, in considering potential impacts to persons and private property, several factors are relevant: the ROI and immediate surrounding areas have relatively low population densities; pilots of aircraft are instructed to avoid direct overflight of population centers at very low altitudes; and, the limited amount of time the aircraft is over any specific geographic area limits the probability that impact of a disabled aircraft in a populated area would occur.

Other effects of an aircraft crash include the potential for fire and environmental contamination. Weather and surface conditions (topography, vegetation, etc.) will determine the extent of fire. When an aircraft crashes, it may release hydrocarbons. Those petroleum, oils, and lubricants (POLs) not consumed in a fire could contaminate soil and water, depending on the physical characteristics of the area where the crash occurs.

Based on historical data on mishaps involving U.S. aircraft at all installations world-wide, and under all conditions of flight, the military services calculate Class A mishap rates per 100,000 flying hours for each type of aircraft in the inventory. Combat losses due to enemy action are excluded from these statistics.

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Based on scheduled use of airspace regions, the annual amount of flight time of each aircraft using the airspace can be estimated. Then, the Class A mishap rate per 100,000 flying hours can be used to compute a statistical projection of anticipated time between Class A mishaps in each applicable element of airspace. These data are only statistically predictive. Class A mishaps result from many factors, not simply the amount of flying time of the aircraft.

Rotary-wing operations occur throughout the McGregor Range area. There are several landing areas, and terrain flying areas that support low altitude flight operations. Detailed safety procedures govern the use of these facilities, and hazards to flight associated with the use of these areas (U.S. Army, 1993a).

In 1996, 842 aviation operations occurred in the McGregor Range airspace that were directly associated with Fort Bliss operations. Additionally, an unscored air-to-ground bombing range (bomb circle) that is used by the USAF for training originating from HAFB is located in the northern portion of McGregor Range. Last year, 1,151 aircraft delivered training ordnance on that target. All of the training ordnance were training or inert bombs that do not explode.

When airspace use by all fixed- and rotary-wing aircraft using McGregor Range is considered, there is little overall risk associated with aviation activities on McGregor Range. For all aircraft involved, the minimum statistically estimated time between Class A mishaps is more than 95 years. If this level of flight activity is considered to remain constant, it equates to one chance in 22,466 of an accident, or a risk probability of 0.00004. All other aircraft using the airspace have significantly lower risk.

During the last 5 years, one incident occurred on McGregor Range where two helicopters collided in mid-air. Both aircraft were destroyed (Pino, 1997).

3.13.3 Explosive Safety

All explosives associated with the mission at Fort Bliss are stored, processed, handled, and transported by trained, fully-qualified personnel using approved technical data and explosive safety practices. Explosives are used throughout the Fort Bliss Complex.

Ordnance and explosives are stored on McGregor Range in approved and licensed storage facilities. No explosive safety waivers are in effect (Tressler, 1997).

During training, use of ordnance on the range is guided by SOPs that provide detailed direction on the handling of explosives, and explosive safety (U.S. Army, 1996n). When feasible after an exercise, the area used is groomed to ensure proper disposal and disposition of all ordnance, including that which is considered an ordnance or explosive hazard, or malfunctioned ordnance. Impact areas are not sanitized on a regular basis. Therefore, ordnance or explosive hazards may be encountered in those areas. Detailed instructions regarding designating and marking of ordnance or explosive hazard, if it is encountered, is provided in SOPs. When necessary, EOD specialists are available to render the ordnance safe. It is either destroyed in-place, or removed for demolition on an EOD range (U.S. Army, 1996n).

During 1996, an archive search report of potential ordnance and explosive hazards was prepared addressing McGregor Range (U.S. Army, 1996o).

The following locations on McGregor Range represent some of the areas with the highest potential for ordnance or explosive debris contamination (Figure 3.13-1). Review of historical documents indicates that almost all sections of McGregor Range have been used for ordnance-related activities. Many areas have received multiple uses from various weapons systems. Besides the intense use of specific locations,

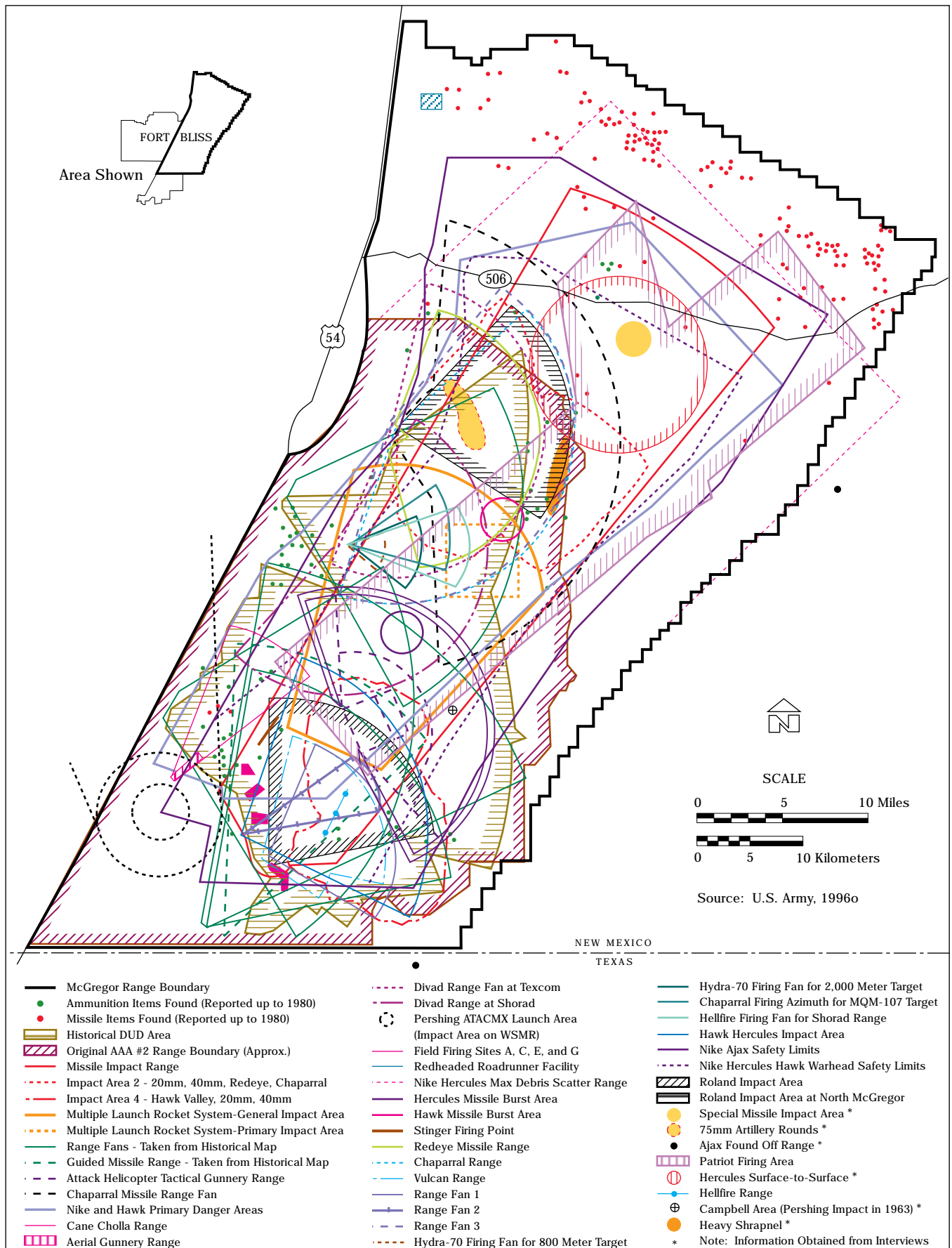


Figure 3.13-1. Historic Weapons Firing Locations, Impact Fans, and Locations of Known Ordnance Debris on McGregor Range.

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the overall range has been subjected to possible ordnance and explosive hazards from the high- and medium-altitude missiles. The report describes areas with potential ordnance and explosive hazards from both historical and current activities. Discussed are antiaircraft artillery (AAA) ranges, missile debris firing areas, and MLRS areas and missile debris areas.

3.13.3.1 AAA Ranges

All Impact areas within the AAA range fans may contain duds. All weapons fired on the ranges, other than the smaller caliber weapons, were high dud producers. Ordnance debris found in 1980 indicated that some debris was found outside the fan areas.

3.13.3.2 Missile and Rocket Firing Areas

The range fans and subsequent impact areas of the following locations should be considered as possible remaining ordnance areas.

FAW 4 and Appropriate Fans. The 20mm, 25mm, and 40mm ammunition fired on the range have been known in the past to be dud producers. Also, 81mm mortars were used on the range. These mortars were illuminating, not high explosive (HE), but may still pose a hazard.

FAW 10 and Appropriate Fans. The 20mm, 25mm, and 40mm ammunition fired on the range have been known in the past to be dud producers. It has been documented that high explosive incendiary (HEI) 20mm Vulcan rounds were fired here. The 81mm mortars were present at this range as well.

3.13.3.3 Cane Cholla

This range may have a high level of unexploded ordnance. The 20mm, 25mm, and 40mm ammunition fired on the range have been known in the past to be dud producers. The 40mm ammunition included grenade launched rounds. Illuminating 4.2-inch and 81mm mortars were also used on this range and may pose a hazard. The 2.75-inch Folding-fin Aircraft Rocket (FFAR) rockets, AT-4's and LAW rockets fired on the range may pose the greatest threat.

3.13.3.4 SHORAD and TEXCOM Ranges

These ranges are kept relatively clean of surface debris because both are certified for laser operations. Human health and safety concerns are prime considerations when a range or target area is certified for laser use. This is due to the potential for eye damage from exposure to the laser beam. Therefore, target areas are cleared of any foreign or natural reflective surfaces before being certified for laser use. However, duds from the 40mm Sergeant York may still be present in the areas. At SHORAD, 2.75-inch Hydra rockets, TOW missiles, 25mm ammunition, and various forms of the Gun-Low Altitude Air Defense System (GLAADS) ammunition were fired. These may all be high dud producers. The 81mm illuminating mortars were also present at TEXCOM.

3.13.3.5 Field Firing Site A and Related Fans

Vulcan ARTEP firings of 20mm rounds took place on this range.

3.13.3.6 Duster and Small Arms Air Defense (SAAD) Range

Both 20mm and 40mm ammunition were fired on these ranges. Duds may be present.